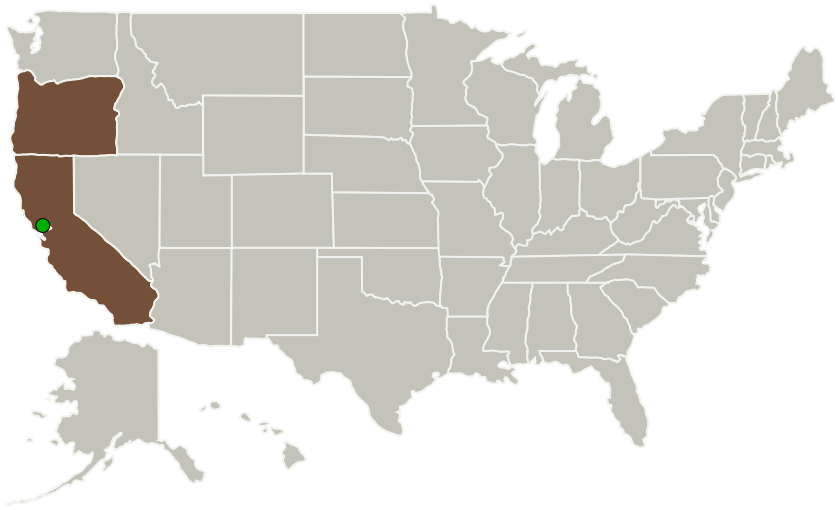
Highly Efficient Fecal Waste Incinerator, Phase I

Completed Technology Project (2012 - 2012)

Project Introduction

Volume reduction is a critical element of Solid Waste Management for manned spacecraft and planetary habitations. To this end, the proposed fecal waste incinerator may be utilized to completely mineralize feces to harmless inorganic substances such as CO2 and water. These products may then be rerouted to the ECLSS processes for hydrogen CO2 reduction to form water and water electrolysis to yield oxygen and hydrogen. Fecal oxidation takes place in two coupled reactors utilizing advanced heat exchanger technology, one to incinerate the feces and the second to oxidize incineration products. Little energy input is required due to the use of fecal matter heat of combustion in combination with efficient heat exchange. Feces are incinerated immediately after collection, eliminating the need for waste stabilization that would otherwise be required to eliminate offensive odors and control microbial growth. All evolved gases including incompletely oxidized volatile organics are passed through a catalytic reactor, ensuring complete combustion to avoid loading the Trace Contaminant Control System. This innovative system is light, compact, simple, energy efficient, contains few moving parts, is virtually maintenance free, and requires little astronaut time.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
UMPQUA Research Company	Lead Organization	Industry	Myrtle Creek, Oregon
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Oregon

Project Transitions

February 2012: Project Start

August 2012: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138590)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

UMPQUA Research Company

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

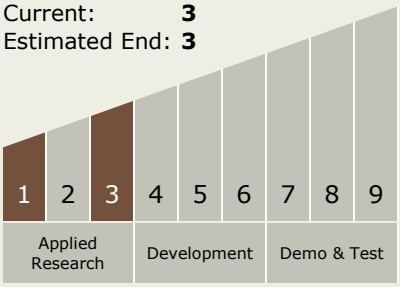
Carlos Torrez

Principal Investigator:

John Holtsnider

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.3 Waste Management

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System